IN THE CLAIMS:

Please cancel claims 12 and 21-41 without prejudice, add new claims 42-45 and amend the claims as follows:

1. (Currently Amended) A method for predicting a plurality of surface multiples for a plurality of traces in a record of seismic data, comprising:

providing a plurality of target traces at a nominal offset and a nominal azimuth;

selecting a plurality of pairs of input traces, wherein the midpoints of the input traces in each pair are separated by half the nominal offset and the azimuth of a line connecting the midpoints of the input traces in each pair is equal to the nominal azimuth;

convolving the selected pairs of input traces to generate a plurality of convolutions; and

applying a three dimensional operator to the convolutions, wherein the three dimensional operator is a three dimensional demigration operator having an offset equal to half the nominal offset and a velocity equal to one of half the water velocity or half of a multiple velocity function.

2. (Original) The method of claim 1, further comprising preconditioning the input traces to simulate zero offset traces.

3. (Original) The method of claim 1, further comprising preconditioning the input traces to simulate zero offset traces by a moveout correction.

4. (Original) The method of claim 1, wherein the target traces provide the locations at which the surface multiples are predicted.

5. (Original) The method of claim 1, wherein the nominal offset is a central offset value within a range of offsets.

6. (Original) The method of claim 1, wherein the nominal azimuth is a central azimuth value within a range of azimuths.

7. (Original) The method of claim 1, wherein selecting the pairs of input traces comprises selecting the input traces at half the nominal offset.

8. (Original) The method of claim 1, further comprising interpolating and regularizing the input traces.

9. (Original) The method of claim 1, further comprising locating each convolution at the midpoint of the line connecting the midpoints of the input traces in each pair.

10. (Original) The method of claim 1, wherein applying the three dimensional operator to the convolutions comprises locating the result of the three dimensional operator application at the midpoints of the target traces.

11. (Original) The method of claim 10, further comprising correcting the result to an actual offset and an actual azimuth.

12. (Cancelled)

13. (Currently Amended) A method for predicting a plurality of surface multiples for a plurality of traces in a record of seismic data, comprising:

dividing a plurality of target traces into one or more groups according to offsets;

dividing each group into one or more subgroups according to azimuths;

selecting a first subgroup having a first nominal offset and a first nominal azimuth;

selecting a plurality of pairs of input traces, wherein the midpoints of the input traces in each pair are separated by half the first nominal offset and the azimuth of a

line connecting the midpoints of the input traces in each pair is equal to the first nominal azimuth;

convolving the selected pairs of input traces to generate a plurality of convolutions; and

applying a three dimensional operator to the convolutions, wherein the three dimensional operator is a three dimensional demigration operator having an offset equal to half the first nominal offset and a velocity equal to one of half the water velocity or half of a multiple velocity function.

14. (Original) The method of claim 13, wherein the target traces within each group are at a nominal offset.

15. (Original) The method of claim 14, wherein the nominal offset is a central offset value within a range of offsets.

16. (Original) The method of claim 13, wherein the target traces within each subgroup are at a nominal offset and a nominal azimuth.

17. (Original) The method of claim 15, wherein the nominal azimuth is a central azimuth value within a range of azimuths.

18. (Original) The method of claim 13, further comprising preconditioning the input traces to simulate zero offset traces.

19. (Original) The method of claim 13, further comprising locating each convolution at the midpoint of the line connecting the midpoints of the input traces in each pair.

20. (Original) The method of claim 13, wherein applying the three dimensional operator to the convolutions comprises locating the result of the three dimensional operator application at the midpoints of the target traces.

21-41. (Cancelled)

42. (New) A method for predicting a plurality of surface multiples for a plurality of traces in a record of seismic data, comprising:

providing a plurality of target traces at a nominal offset and a nominal azimuth;

selecting a plurality of pairs of input traces, wherein the midpoints of the input traces in each pair are separated by half the nominal offset and the azimuth of a line connecting the midpoints of the input traces in each pair is equal to the nominal azimuth;

convolving the selected pairs of input traces to generate a plurality of convolutions; and

applying a three dimensional operator to the convolutions, wherein the three dimensional operator is a poststack (zero-offset) demigration.

43. (New) The method of claim 42, wherein applying the three dimensional operator comprises applying a dip moveout (DMO) and inverse moveout correction.

44. (New) A method for predicting a plurality of surface multiples for a plurality of traces in a record of seismic data, comprising:

dividing a plurality of target traces into one or more groups according to offsets;

dividing each group into one or more subgroups according to azimuths;

selecting a first subgroup having a first nominal offset and a first nominal azimuth;

selecting a plurality of pairs of input traces, wherein the midpoints of the input traces in each pair are separated by half the first nominal offset and the azimuth of a line connecting the midpoints of the input traces in each pair is equal to the first nominal azimuth;

convolving the selected pairs of input traces to generate a plurality of convolutions; and

applying a three dimensional operator to the convolutions, wherein the three dimensional operator is a poststack (zero-offset) demigration.

45. (New) The method of claim 44, wherein applying the three dimensional operator comprises applying a dip moveout (DMO) and inverse moveout correction.